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Cc: CN=Dave Moon/OU=R8/O=USEPA/C=US@EPA;CN=Tonya Fish/OU=R8/O=USEPA/C=US@EPA[]; N=Tonya Fish/OU=R8/O=USEPA/C=US@EPA[]
Bcc: []
From: CN=Tina Laidlaw/OU=MO/OU=R8/O=USEPA/C=US
Sent: Tue 8/7/2012 8:10:26 PM
Subject: EPA Comments
Montana Nutrients Rules with EPA suggested edits 2012-08-07.docx
MT Dept Nutrients Circular 12 with EPA suggested edits 2012-08-07.docx

George, Eric, and Mike,

Attached are EPA's comments on Montana's draft nutrient rules. Thank you for meeting with us yesterday to discuss our suggested edits. Please let us know if you have any follow-up questions or concerns.

Tina

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REASON: Overview of Why Base Numeric Nutrient Standards and Nutrient Standards Variances are Necessary. The board or department is proposing the adoption of new rules and rule modifications. These are: New Rule I; new definitions; a new circular (DEQ-12 Part A, adopted by the board) which contains numeric nutrient standards for total nitrogen and total phosphorus; DEQ-12 Part B which addresses variances from the standards (DEQ-12 Part B is adopted by the department); incorporation of circular DEQ-12 Part A into the surface water quality classifications (ARM 17.30.622 through 17.30.629); modifications to the numeric nutrient standards for the Clark Fork River (ARM 17.30.631); a low flow for base numeric nutrient standards appropriate for the design of disposal systems (ARM 17.30.635[4]); and incorporation of DEQ-12 Part A into the nondegradation rules (ARM 17.30.702 and ARM 17.30.715).

The department has documented that various forms of nitrogen and phosphorus rank as the 4th, 8th, 10th, and 12th most common types of pollution in Montana's flowing waters. In fact, excess nitrogen and phosphorus levels account for 17% of all stream miles impaired by all forms of water pollution in Montana. The intent of the proposed nutrient standards is to control the undesirable effects of eutrophication. Eutrophication is the enrichment of a waterbody (e.g., a stream or lake) by nitrogen and phosphorus, which leads to increased plant and algae growth and decay and all the consequential changes to the water quality that occur thereof. At present the state does not have numeric water quality standards for controlling eutrophication except on the Clark Fork River. As a result, in most cases permit limits (including waste load allocations determined in Total Maximum Daily Loads, i.e. TMDLs) are based upon the narrative water quality standard. The narrative standard prohibits substances in water that "create conditions which produce undesirable aquatic life" (ARM 17.30.637[1][e]).Translating the narrative standard into enforceable permit limits on a case-by-case basis is time-consuming, potentially controversial, and may result in inconsistent or differing permit limits due to various interpretations among permit or TMDL writers. Numeric nutrient criteria will resolve this.

The effects of excess nitrogen and phosphorus in streams and rivers go well beyond the undesirable aquatic life referred to in the narrative standard. Excess nitrogen and phosphorus affect other water quality parameters for which the state already has standards (dissolved oxygen, pH). The state-of-the-science is such that linkages can clearly be made between nitrogen and phosphorus concentrations and these other, already-adopted standards. Thus, the numeric nutrient criteria will also assure protection and attainment of the state's dissolved oxygen and pH standards which are, in and of themselves, critical to the protection of fish and aquatic life.

The nutrient criteria concentrations being proposed for adoption as standards are generally low, particularly in the western region of Montana. In many cases the concentrations are below the limits of current wastewater treatment technology, therefore when little or no stream dilution is available dischargers will find it difficult to meet the standards. Senate Bill 95 (2009 Legislature) and Senate Bill 367 (2011 Legislature), now codified at §75-5-313, MCA addressed the high cost and technological difficulties associated with meeting the nutrient standards in the short term. State law at §75-5-313, MCA allows dischargers to be granted variances from

numeric nutrient standards—once the criteria have been adopted as standards—in those cases where meeting the standards today would be unreasonably economically burdensome or technologically infeasible. Variances from the standards may be granted for up to twenty years. Thus, statute at §75-5-313, MCA allows for the nutrient standards to be met in a staged manner over time as alternative effluent management methods are considered, nutrient removal technologies become more cost-effective and efficient, and nonpoint sources of nutrients are addressed.

Rules or rule modifications (and Reasons thereof) that implement §75-5-313, MCA are mainly found below in New Rule I, however they are found throughout ARM Title 17, chapter 30, subchapters 6 and 7; specific details are provided in the Reasons for each rule amendment proposal.

NEW RULE I: NUTRIENT STANDARDS VARIANCES

(1) A person may apply to the department for a nutrient standards variance at any time following the board's adoption of base numeric nutrient standards.

(2) An application for an individual variance must provide adequate demonstration that there are no reasonable alternatives that eliminate the need for a variance and that attainment of the base numeric nutrient standards is precluded due to economic impacts, the limits of technology, or both. If the demonstration relies upon economic impacts, the demonstration must be consistent with the guidelines developed by the department and the nutrient work group, as provided in 75-5-313(2), MCA.

(3) The department may propose adoption of an individual variance that specifies interim effluent limits different than what would apply under the general variance where water quality modeling and/ or ambient water quality data demonstrates that one nutrient is more strongly limiting. Such effluent limits shall reflect the lowest effluent concentration that is feasible based on achieving the highest attainable condition for the receiving water. A person must submit the proposed effluent limits and supporting data in any demonstration they make for an application for an individual nutrient variance under paragraph (2).

(a) Any person who has effluent limits in their individual variance based on paragraph (3) must collect and submit water quality data to demonstrate in each subsequent triennial review if the pollutant-limited status of the receiving water continues to justify those effluent limits. Data collection must be consistent with guidelines developed by the department and the nutrient work group.

(4) The department shall review each application for an individual variance to determine whether a reasonable alternative, such as trading, a permit compliance schedule, a general variance, reuse, recharge, or land application would eliminate the need for an individual variance. If the department makes a preliminary finding that a reasonable alternative to approving an individual variance is available, the department shall consult with the applicant prior to making a final decision to approve or deny the individual variance.

(5) If, after consultation with the applicant, the department determines that no reasonable alternative to an individual variance exists, the department must determine whether the information provided by the applicant in (2) adequately demonstrates that attaining the base numeric nutrient standards is not feasible. If the department finds that attaining the base numeric nutrient standards is not feasible, the department shall approve an individual variance, which will become effective and incorporated into the applicant's permit only after adoption by the department in a formal rulemaking proceeding. Like any variance, such variances must be adopted

as revisions to Montana standards, reviewed on a triennial basis, and submitted to EPA for approval.
(6) An application for a general variance must provide information demonstrating that the wastewater treatment facility meets the requirements of 75-5-313(5)(b), MCA, or updated concentrations subsequently adopted by the department. The decision to grant the general variance will be reflected in the permit that is made available for public comment.
(7) Based on the triennial review findings and conclusions, and with respect to both general and individual variances, the Department will issue a rulemaking proposal for public comment. The proposal will solicit comments from the public on whether each variance should be: (1) re-adopted without changes, (2) re-adopted with changes, or (3) deleted. This will include general variance categories and the interim limits for each category, but not identification of facilities included in each category (as discussed in paragraph (6)). The results of the review, including all variances whether they were re-adopted without changes, re-adopted with changes, or deleted, and all supporting analyses, will then be submitted to EPA as new or revised water quality standards. EPA will review the information provided and approve or disapprove the variances based on the requirements of the Clean Water Act and EPA's implementing regulations. If the Department does not meet the statutory requirements at SV367, Section 3, Paragraph 7 by implementing the process set out in this paragraph within 24 months after May 31, 2016, the general variance will expire on May 31, 2019.
(8) A variance is not needed in situations where a person complies with the waste load allocation established in an approved TMDL.

REASON: The Board is proposing New rule I (1) through (7) to implement Senate Bill 95 (2009 legislature) and Senate Bill 367 (2011 Legislature), which are codified at §75-5-313, MCA. New Rule I (1), (2), (3), and (4) provide the department a step-wise process to determine whether a person may be granted an individual nutrient standards variance. In New Rule I (1), it is made clear that individual variances are available only after the time that the board adopts numeric nutrient criteria as standards. New Rule I (2) requires the applicant to explore alternatives to discharging that may preclude the need for a variance. New Rule I (3) allows the department to consult with the applicant regarding what the department perceives to be the availability of reasonable alternatives which would preclude the need for the individual variance. This consultation would occur before the department makes a final decision regarding the granting of the individual variance. If it results that no reasonable alternative can be identified, New Rule I (4) instructs the department to determine if the applicant has adequately demonstrated that attaining the standards is infeasible. This will be carried out using guidance documents developed by the department and the nutrient work group. The guidance documents provide a process to assess economic hardship that would be incurred by the applicant if the applicant were to meet the standards at the time of the application. A definition in circular DEQ-12 Part B defining the limits of technology for nutrient removal will be available for those cases where the individual variance is based on the limits of technology. New Rule I (5) addresses the need for applicants to demonstrate that they are meeting (or soon will, via a compliance schedule) the category-specific concentrations or conditions in statute. The department is required to adopt the categories and their associated concentrations/conditions into department rule by May 31, 2016. After that, the concentrations/conditions associated with each category may be updated

by the department if more cost effective and efficient treatment technologies become available. Concentrations/conditions applicable to each general variance category will be housed in department circular DEQ-12 Part B. New Rule I (6) addresses situations where water quality modeling and/or data from a river or stream segment indicate that one nutrient is much more strongly limiting. In such cases, requiring a point source discharger to install more sophisticated nutrient-removal technologies in order to reduce the nutrient which is currently non-limiting may not be the most prudent nutrient control expenditure. Because this status can change, for example due to substantive nonpoint source cleanups upstream of the discharger, status monitoring by the discharger is required. New Rule I (7) simply makes clear that in TMDL development insignificant loading of nutrients from a discharger is an option that can be considered, as is already done in TMDLs for other pollutants. 17.30.602 DEFINITIONS In this subchapter the following terms have the meaning indicated below and are supplemental to the definitions given in 75-5-303, MCA:

(1) through (15) remain the same.

(16) "Limits of technology" means the best wastewater treatment processes that exist for the removal of nitrogen and phosphorus compounds from wastewater.

(16) through (32) remain the same but are renumbered (17) through (33).

(34) "Soluble reactive phosphorus" means dissolved orthophosphate, as P, determined by direct colorimetry from a filtered sample. The pore size of the filter used must be 0.45 µm. The RRV for soluble reactive phosphorus is 3 micrograms per liter.

(33) and (34) remain the same but are renumbered (35) and (36), respectively.

~~(35)~~ (37) "Total nitrogen" means the ~~total nitrogen concentration (as N) of unfiltered water. This may be determined by direct methods, or derived as the sum of the soluble (as N) and non-soluble (as N) nitrogen fractions. The filter used to separate the soluble and non-soluble fractions must be 0.45 µm~~ sum of all nitrate, nitrite, ammonia, and organic nitrogen, as N, in an unfiltered water sample. Total nitrogen in a sample may also be determined by persulfate digestion, or as the sum of total kjeldahl nitrogen plus nitrate plus nitrite.

~~(36)~~ (38) "Total phosphorus" means the ~~total phosphorus concentration (as P) of unfiltered water~~ sum of orthophosphates, polyphosphates, and organically bound phosphates, as P, in an unfiltered water sample. Total phosphorus may also be determined directly by persulfate digestion.

(37) through (40) remain the same but are renumbered (39) through (42).

~~(41)~~ (43) "DEQ-7" means the department circular that is adopted and incorporated by reference in ARM 17.30.619 and is entitled "Montana Numeric Water Quality Standards." This circular establishes water quality standards for toxic, carcinogenic, bioconcentrationg, ~~nutrient~~, radioactive, and harmful parameters, and also establishes human health-based water quality standards for the following specific nutrients with toxic effects: nitrate, nitrate + nitrite, and nitrite.

(44) "DEQ-12" means the department circular that is adopted and incorporated by reference in ARM 17.30.619 and is entitled "Montana Base Numeric

Nutrient Standards and Nutrient Standards Variances" This circular contains numeric water quality standards for total nitrogen and total phosphorus in surface waters and also contains variances from those standards.

REASON: The proposed amendments to ARM 17.30.602 provide new definitions (and modification of old definitions) in order to implement the nutrient standards. The amendments necessitated renumbering the existing definitions in rule. The new definition at (16), "Limits of Technology", is necessary in order to be able to implement New Rule I (2) discussed above. The concentration limits in (16) were derived after extensive discussions among department engineers, external engineers, and the nutrient work group. The new definition at (34), "Soluble reactive phosphorus", is necessary to implement related assessment information listed in DEQ-12 part A for Flathead Lake. Both total and soluble nutrient fractions have been developed for assessing this lake; the board is proposing that the total fractions be adopted as standards (consistent with other base numeric nutrient standards) and the soluble fractions be adopted as related assessment information. The modified definition of "Total nitrogen" (renumbered as 37) provides a more technically accurate description compared to the old definition. The same is true for "Total phosphorus" (renumbered as 38). In the definition for DEQ-7 (renumbered 43), "nutrient" has been removed because base numeric nutrient standards will now be housed in a new department circular, circular DEQ-12. Some nitrogen compounds (nitrate, nitrite, and nitrate + nitrate) have toxic effects at relatively high concentrations and standards for them are intended to protect human health; by definition at §75-5-103(2)(b), MCA, these compounds are not considered part of the base numeric nutrients standards. Therefore, they will remain in DEQ-7 and are now listed under the DEQ-7 definition for better clarity. The new definition at (44), "DEQ-12", defines the new department circular where numeric nutrient standards and variances from the standards will be housed. In addition to the criteria concentrations, the circular includes instructions on how to develop permits for base numeric nutrient standards, how the department will go about granting nutrient standards variances, and a table to document recipients of individual variances. As there are likely to be modifications and additions to parts of DEQ-12 going forward, the department concluded that a circular would be the best means by which this complex information could be routinely updated. And, of equal importance, all of the information will be made available to the public in a single document.

17.30.619 INCORPORATIONS BY REFERENCE (1) The board adopts and incorporates by reference the following state and federal requirements and procedures as part of Montana's surface water quality standards:

(a) Department Circular DEQ-12, entitled "Montana Base Numeric Nutrient Standards and Nutrient Standards Variances," Part A (September 2012 edition), which establishes numeric water quality standards for total nitrogen and total phosphorus in surface waters;

~~(a)~~ (b) Department Circular DEQ-7, entitled "Montana Numeric Water Quality Standards" (August 2010 edition), which establishes water quality standards for toxic, carcinogenic, bioconcentrating, ~~nutrient,~~ and harmful parameters and also establishes human health-based water quality standards for the following specific nutrients with toxic effects: nitrate; nitrate + nitrite; and nitrite;

(b) through (f) remain the same but are renumbered (c) through (g).

(2) The department adopts and incorporates by reference the following as part of Montana's surface water quality standards:

Department Circular DEQ-12, entitled "Montana Base Numeric Nutrient Standards and Nutrient Standards Variances," Part B (September 2012 edition), which establishes variances from the numeric water quality standards for total nitrogen and total phosphorus in surface waters adopted by the board in Part A of Department Circular DEQ-12.

(2) remains the same but is renumbered (3).

REASON: The proposed amendments to ARM 17.30.619 allow for dated versions of new department circular DEQ-12 to be incorporated into other parts of the rules. It is likely that DEQ-12 will be updated through time and these future changes will affect permit limits, TMDLs, etc. As such, the document needs to be dated so that users will know which version is current. In amended (a) of the rule, reference is made to Part A of DEQ-12. Part A includes a table of the base numeric nutrient standards and, as such, is to be adopted by the board pursuant to its authority to adopt water quality standards at §75-5-301(2), MCA. The amendments to the definitions for Circular DEQ-7 correspond to those already discussed above for definitions (ARM 17.30.602). Part B of Circular DEQ-12, which focuses on nutrient standards variances and how these are to be implemented and updated, is not adopted by the board but is instead adopted by the department. Part B of DEQ-12 may also change through time (for example, if individual variances are granted they will be documented here), and so it needs to be a dated document as provided for here in (2).

17.30.622 A-1 CLASSIFICATION STANDARDS (1) through (2) remain the same.

(3) No person may violate the following specific water quality standards for waters classified A-1:

(a) through (g) remain the same.

(h) Concentrations of carcinogenic, bioconcentrating, toxic, radioactive, nutrient, or harmful parameters may not exceed the applicable standards set forth in department Circular DEQ-7 and, unless a nutrient standards variance from the base numeric nutrient standards has been granted pursuant to DEQ-12 Part B, Circular DEQ-12 Part A.

(i) Dischargers issued permits under ARM Title 17, chapter 30, subchapter 13, shall conform with ARM Title 17, chapter 30, subchapter 7, the nondegradation rules, and may not cause receiving water concentrations to exceed the applicable standards contained in department Circular DEQ-7 and, when applicable, the base numeric nutrient standards or nutrient standards variances in DEQ-12 when stream flows equal or exceed the design flows specified in ARM 17.30.635(4).

(j) through (k) remain the same.

17.30.623 B-1 CLASSIFICATION STANDARDS (1) remains the same.

(2) No person may violate the following specific water quality standards for waters classified B-1:

(a) through (g) remain the same.

(h) Concentrations of carcinogenic, bioconcentrating, toxic, radioactive, nutrient, or harmful parameters may not exceed the applicable standards set forth in

department Circular DEQ-7 and, unless a nutrient standards variance from the base numeric nutrient standards has been granted pursuant to DEQ-12 Part B, Circular DEQ-12 Part A.

(i) Dischargers issued permits under ARM Title 17, chapter 30, subchapter 13, shall conform with ARM Title 17, chapter 30, subchapter 7, the nondegradation rules, and may not cause receiving water concentrations to exceed the applicable standards specified in department Circular DEQ-7 and, when applicable, the base numeric nutrient standards or nutrient standards variances in DEQ-12 when stream flows equal or exceed the design flows specified in ARM 17.30.635(4).

(j) through (k) remain the same.

17.30.624 B-2 CLASSIFICATION STANDARDS (1) remains the same.

(2) No person may violate the following specific water quality standards for waters classified B-2:

(a) through (g) remain the same.

(h) Concentrations of carcinogenic, bioconcentrating, toxic, radioactive, nutrient, or harmful parameters may not exceed the applicable standards set forth in department Circular DEQ-7 and, unless a nutrient standards variance from the base numeric nutrient standards has been granted pursuant to DEQ-12 Part B, Circular DEQ-12 Part A.

(i) Dischargers issued permits under ARM Title 17, chapter 30, subchapter 13, shall conform with ARM Title 17, chapter 30, subchapter 7, the nondegradation rules, and may not cause receiving water concentrations to exceed the applicable standards specified in department Circular DEQ-7 and, when applicable, the base numeric nutrient standards or nutrient standards variances in DEQ-12 when stream flows equal or exceed the design flows specified in ARM 17.30.635(4).

(j) through (k) remain the same.

17.30.625 B-3 CLASSIFICATION STANDARDS (1) remains the same.

(2) No person may violate the following specific water quality standards for waters classified B-3:

(a) through (g) remain the same.

(h) Concentrations of carcinogenic, bioconcentrating, toxic, radioactive, nutrient, or harmful parameters may not exceed the applicable standards set forth in department Circular DEQ-7 and, unless a nutrient standards variance from the base numeric nutrient standards has been granted pursuant to DEQ-12 Part B, Circular DEQ-12 Part A.

(i) Dischargers issued permits under ARM Title 17, chapter 30, subchapter 13, shall conform with ARM Title 17, chapter 30, subchapter 7, the nondegradation rules, and may not cause receiving water concentrations to exceed the applicable standards specified in department Circular DEQ-7 and, when applicable, the base numeric nutrient standards or nutrient standards variances in DEQ-12 when stream flows equal or exceed the design flows specified in ARM 17.30.635(4).

(j) through (k) remain the same.

17.30.626 C-1 CLASSIFICATION STANDARDS (1) remains the same.

(2) No person may violate the following specific water quality standards for waters classified C-1:

(a) through (g) remain the same.

(h) Concentrations of carcinogenic, bioconcentrating, toxic, radioactive, nutrient, or harmful parameters may not exceed the applicable standards set forth in department Circular DEQ-7 and, unless a nutrient standards variance from the base numeric nutrient standards has been granted pursuant to DEQ-12 Part B, Circular DEQ-12 Part A.

(i) Dischargers issued permits under ARM Title 17, chapter 30, subchapter 13, shall conform with ARM Title 17, chapter 30, subchapter 7, the nondegradation rules, and may not cause receiving water concentrations to exceed the applicable standards specified in department Circular DEQ-7 and, when applicable, the base numeric nutrient standards or nutrient standards variances in DEQ-12 when stream flows equal or exceed the design flows specified in ARM 17.30.635(4).

(j) through (k) remain the same.

17.30.627 C-2 CLASSIFICATION STANDARDS (1) remains the same.

(2) No person may violate the following specific water quality standards for waters classified C-2:

(a) through (g) remains the same.

(h) Concentrations of carcinogenic, bioconcentrating, toxic, radioactive, nutrient, or harmful parameters may not exceed the applicable standards set forth in department Circular ~~WQB~~-DEQ-7 and, unless a nutrient standards variance from the base numeric nutrient standards has been granted pursuant to DEQ-12 Part B, Circular DEQ-12 Part A.

(i) Dischargers issued permits under ARM Title 17, chapter 30, subchapter 13, shall conform with ARM Title 17, chapter 30, subchapter 7, the nondegradation rules, and may not cause receiving water concentrations to exceed the applicable standards specified in department Circular DEQ-7 and, when applicable, the base numeric nutrient standards or nutrient standards variances in DEQ-12 when stream flows equal or exceed the design flows specified in ARM 17.30.635(4).

(j) through (k) remain the same.

REASON: The proposed amendments to ARM 17.30.622 through 627 incorporate circular DEQ-12 into the surface water classes. In each of the six use classes for surface water defined in ARM 17.30.622 through 627 (use classes A-1, B-1, B-2, B-3, C-1, and C-2), the lettered subsections under (2) define the water quality standards that no person may violate. These include subsection (h) which refers to water quality standards in Circular DEQ-7. The amendment to (h) is the incorporation of the nutrient concentrations found in Circular DEQ-12 Part A and, further, clarification that a person may violate the water quality standards in DEQ-12 Part A if they have been granted a nutrient standards variance pursuant to Part B of the circular. Amendments to subsection (i) of the rules address nondegradation and permits. Board adoption of the base numeric nutrient standards will alter the way the department applies nondegradation rules for nutrients. At present, nutrients are addressed by a narrative standard (discussed in the Overview) and, for narrative standards, the nonsignificance threshold (i.e., a level below which water quality degradation is assumed not to have occurred) is defined as a measurable change in aquatic life or ecological integrity. With the adoption of DEQ-12 Part A, nutrients will be numeric standards and, therefore, the approach by which nondegradation of surface waters is determined will change. For numeric standards, nonsignificance thresholds are calculated as a percent of the standard's concentration; thus,

changes to (i) direct the department to the appropriate document (DEQ-12) to locate the numeric nutrient standards used to calculate nonsignificance thresholds.

17.30.628 I CLASSIFICATION STANDARDS (1) remains the same.

(2) No person may violate the following specific water quality standards for waters classified I:

(a) through (i) remain the same.

(j) Beneficial uses are considered supported when the concentrations of toxic, carcinogenic, or harmful parameters in these waters do not exceed the applicable standards specified in department Circular DEQ-7 and DEQ-12 when stream flows equal or exceed the flows specified in ARM 17.30.635(4) or, alternatively, for aquatic life when site-specific criteria are adopted using the procedures given in 75-5-310, MCA. The limits shall be used as water quality standards for the affected waters and as the basis for permit limits instead of the applicable standards in department Circular DEQ-7.

(k) Limits for toxic, carcinogenic, or harmful parameters in new discharge permits issued pursuant to the MPDES rules (ARM Title 17, chapter 30, subchapter 13) are the larger of either the applicable standards specified in department Circular DEQ-7 and, when applicable, the base numeric nutrient standards or nutrient standards variances in DEQ-12, site-specific standards or one-half of the mean in-stream concentrations immediately upstream of the discharge point.

REASON: The proposed amendment to ARM 17.30.628 incorporates new circular DEQ-12 into the I surface water class. I class waterbodies are those which had severe human-caused pollution problems at the time the surface water class system was adopted in the 1970s, and it is the intent of the state that these waterbodies will eventually support beneficial uses typical for ecologically-similar un-impacted waterbodies. Amendments to (j) incorporate DEQ-12 alongside DEQ-7.

17.30.629 C-3 CLASSIFICATION STANDARDS (1) remains the same.

(2) No person may violate the following specific water quality standards for waters classified C-3:

(a) through (g) remain the same.

(h) Concentrations of carcinogenic, bioconcentrating, toxic, radioactive, nutrient, or harmful parameters may not exceed the applicable standards set forth in department Circular DEQ-7 and, unless a nutrient standards variance from the base numeric nutrient standards has been granted pursuant to DEQ-12 Part B, Circular DEQ-12 Part A.

(i) Dischargers issued permits under ARM Title 17, chapter 30, subchapter 13, shall conform with ARM Title 17, chapter 30, subchapter 7, the nondegradation rules, and may not cause receiving water concentrations to exceed the applicable standards specified in department Circular DEQ-7 and, when applicable, the base numeric nutrient standards or nutrient standards variances in DEQ-12 when stream flows equal or exceed the design flows specified in ARM 17.30.635(4).

(j) through (k) remain the same.

REASON: The proposed amendments to ARM 17.30.629 incorporate circular DEQ-12 into the C-3 surface water class. In ARM 17.30.629, the lettered subsections under (2) define the water quality standards that no person may violate; these

include subsection (h) which refers to water quality standards in Circular DEQ-7. The amendment to (h) is the incorporation of the nutrient concentrations found in Circular DEQ-12 Part A and, further, clarification that a person may violate the water quality standards in DEQ-12 Part A if they have been granted a nutrient standards variance pursuant to Part B of the circular. Amendments to subsection (i) of the rules address nondegradation and permits. Board adoption of the base numeric nutrient standards will alter the way the department applies nondegradation rules for nutrients. At present, nutrients are addressed by a narrative standard (discussed in the Overview) and, for narrative standards, the nonsignificance threshold (i.e., a level below which water quality degradation is assumed not to have occurred) is defined as a measurable change in aquatic life or ecological integrity. With the adoption of DEQ-12 Part A, nutrients will be numeric standards and, as such, the approach by which degradation of surface waters is determined will change. For numeric standards, nonsignificance thresholds are calculated as a percent of the standard's concentration; thus, changes to (i) direct the department to the appropriate document (DEQ-12) to locate the numeric nutrient standards used to calculate nonsignificance thresholds.

~~17.30.631 NUMERIC ALGAL BIOMASS AND NUTRIENT STANDARDS~~

~~(1) No person may violate the numeric water quality standards identified below.~~

~~(2) The numeric nutrient and standing crop of benthic algae water quality standards for the mainstem Clark Fork River from below the Warm Springs Creek confluence (N46º11'17", W112º46'03") to the confluence with the Flathead River (N47º21'45", W114º46'43") are as follows:~~

~~(a) In the mainstem Clark Fork River from below the Warm Springs Creek confluence (N46º11'17", W112º46'03") to the confluence with the Blackfoot River (N46º52'19", W113º53'35") the numeric water quality standards for Total Nitrogen, Total Phosphorus, and benthic algal chlorophyll a, applicable from June 21 to September 21, are as follows:~~

~~(i) Parameter~~	~~Concentration~~
~~Total Phosphorus as P~~	~~20 µg/L~~
~~Total Nitrogen as N~~	~~300 µg/L~~
~~(ii) Parameter~~	~~Density~~
~~(Summer mean) - Benthic algal chlorophyll a~~	~~100 mg/square meter~~
~~(Maximum) - Benthic algal chlorophyll a~~	~~150 mg/square meter~~

~~(b) In the Clark Fork River from the confluence with the Blackfoot River (N46º52'19", W113º53'35") to the confluence with the Flathead River (N47º21'45", W114º46'43") the numeric water quality standards for Total Nitrogen, Total Phosphorus, and benthic algal chlorophyll a, applicable from June 21 to September 21, are as follows:~~

~~(i) Parameter~~	~~Concentration~~
~~Total Phosphorus as P~~	~~39 µg/L~~
~~Total Nitrogen as N~~	~~300 µg/L~~
~~(ii) Parameter~~	~~Density~~
~~(Summer mean) - Benthic algal chlorophyll a~~	~~100 mg/square meter~~

~~(Maximum) - Benthic algal chlorophyll a~~ ~~150 mg/square meter~~

REASON: The Board's rationale for the proposed repeal of ARM 17.30.631 is that the contents of the entire rule will be housed in department circular DEQ-12 Part A. In addition to moving the contents of ARM 17.30.631 to the new circular, there are proposed changes to the *content* of ARM 17.30.631 that will appear in DEQ-12 Part A. Specifically, the time period during which the Clark Fork River nutrient standards apply will be changed to July 1st to September 30th of each year. This change is in keeping with the time period being proposed for other streams and rivers in the region of the Clark Fork River. The proposed July 1 to September 30th time frame was derived from a scientific analysis of streams and rivers across the state and is documented in a peer-reviewed scientific journal article. The total phosphorus standard for the reach of the Clark Fork River commencing at the confluence of the Blackfoot River has been lowered from 39 µg/L to 24 µg/L. Scientific analysis of twelve years of monitoring data on the Clark Fork River indicate that the lower TP standard is necessary in order to achieve the benthic (bottom-attached) algal biomass levels; this is documented in a peer-reviewed scientific journal article. Finally, the department is proposing that the benthic algae chlorophyll *a* standards for the Clark Fork River be repealed and, instead, be listed in DEQ-12 as "Related Assessment Information". At the time that the Clark Fork River nutrient and benthic chlorophyll *a* standards were adopted (2002), the department had limited experience structuring stream and river rules for numeric nutrient standards. As a result, *both* nutrients (the cause) and benthic chlorophyll *a* (the effect) were adopted as standards. Since that time, the department has invested significant work into understanding relationships between nutrients and benthic algal chlorophyll *a*. At the current state of stream science, the department believes it is adequate to adopt only the nutrients as standards, and then use algal chlorophyll *a* as one of a suite of ecological parameters that are considered when carrying out routine monitoring and assessment of the state's rivers and streams. The department already has a finalized guidance document on how to assess streams using nutrients, chlorophyll *a*, and other parameters. In summary, the proposed rule amendments (period of application of the standards, updated total phosphorus standard, and changing benthic algal chlorophyll *a* to related assessment information) will bring the standards for the Clark Fork River in alignment with the proposed standards for other regional rivers and streams, and up-to-date in terms of the state of the science.

17.30.635 GENERAL TREATMENT STANDARDS (1) through (3) remain the same.

(4) For design of disposal systems, stream flow dilution requirements must be based on the minimum consecutive seven-day average flow which may be expected to occur on the average of once in 10 years. When dilution flows are less than the above design flow at a point discharge, the discharge is to be governed by the permit conditions developed for the discharge through the waste discharge permit program. If the flow records on an affected surface water are insufficient to calculate a 10-year seven-day low flow, the department shall determine an acceptable stream flow for disposal system design. ~~The department shall determine the acceptable stream flow for disposal system design for controlling nitrogen and~~

~~phosphorus concentrations.~~ For total nitrogen and total phosphorus, the stream flow dilution requirements must be based on the seasonal 14Q5, which is the lowest average 14 consecutive day low flow, occurring from July through October, with an average recurrence frequency of once in 5 years.

REASON: The proposed amendments to ARM 17.30.635 will provide a low flow for the design of disposal systems specific to eutrophication-based nutrient standards. The text of the rule that received strike-out was essentially placeholder language instructing the department to derive an appropriate low flow for nutrients. That work has now been completed. Work by the department and others shows that nuisance benthic algae can develop in about 15-20 days once nutrient concentrations exceed the proposed standards. In many streams these algae levels can ultimately lead to dissolved oxygen impacts. The department recommends the use of the seasonal 14Q5 flow for the design of disposal systems as this flow should not allow excess algae levels to develop more often than about once in every five summers, on average. This frequency of exceedence is within the acceptable recommendations of the U.S. Environmental Protection Agency for the protection of aquatic life. Unlike the 7Q10 flow, which will continue to be used for parameters in DEQ-7 and which was derived from year-round flow data, the seasonal 14Q5 flow is derived from July through October data and is therefore in alignment with the nutrient standards' periods of application. The seasonal 14Q5 is routinely calculated and reported by the U.S. Geological Survey and will be readily available for permit writers to use.

17.30.702 DEFINITIONS The following definitions, in addition to those in 75-5-103, MCA, apply throughout this subchapter (Note: 75-5-103, MCA, includes definitions for "base numeric nutrient standards," "degradation," "existing uses," "high quality waters," "mixing zone," and "parameter"):

(1) through (16) remain the same.

~~(17) "Nutrients" means total inorganic phosphorus and total inorganic nitrogen.~~

(18) through (21) remain unchanged but are renumbered (17) through (20).

~~(22)~~ (21) "Reporting values (RRV)" means the detection level that must be achieved in reporting surface water or ground water monitoring or compliance data to the department unless otherwise specified in a permit, approval, or authorization issued by the department. The RRV is the department's best determination of a level of analysis that can be achieved by the majority of commercial, university, or governmental laboratories using EPA approved methods or methods approved by the department. The RRV is listed in Circular DEQ-7, Part A of Circular DEQ-12, and the definition of total inorganic phosphorus.

(23) remains the same but is renumbered (22).

(23) "Total inorganic phosphorus" means the sum of all orthophosphates, as P, in an unfiltered water sample. Total inorganic phosphorus may also be determined by direct colorimetry. The RRV for total inorganic phosphorus is 3 micrograms per liter.

(24) "Total nitrogen" means the sum of all nitrate, nitrite, ammonia, and organic nitrogen, as N, in an unfiltered water sample. Total nitrogen in a sample may also be determined by persulfate digestion, or as the sum of total kjeldahl nitrogen plus nitrate plus nitrite.

(25) "Total phosphorus" means the sum of orthophosphates, polyphosphates, and organically bound phosphates, as P, in an unfiltered water sample. Total phosphorus may also be determined directly by persulfate digestion.

(24) through (25) remain the same but are renumbered (26) and (27).

~~(26)~~ (28) The board adopts and incorporates by reference:

(a) Department Circular DEQ-12, entitled "Montana Base Numeric Nutrient Standards and Nutrient Standards Variances," Part A (March 2012 edition), which establishes numeric water quality standards for total nitrogen and total phosphorus in surface waters.

~~(a)~~ (b) Department Circular DEQ-7, entitled "Montana Numeric Water Quality Standards" (August 2010 edition), which establishes water quality standards for toxic, carcinogenic, bioconcentrating, ~~nutrient,~~ radioactive, and harmful parameters and also establishes human health-based water quality standards for the following specific nutrients with toxic effects: nitrate; nitrate + nitrite, and nitrite;

(b) through (d) remain the same but are renumbered (c) through (e).

REASON: The proposed amendments to ARM 17.30.702 will modify current definitions in the nondegration rules and will add new definitions necessary for the implementation of numeric nutrient standards. "Base numeric nutrients standards" have been added to the list of definitions from §75-5-103, MCA that are incorporated by reference. Definition (17)"Nutrients" is being repealed because it is not consistent with the use of the term in circular DEQ-12 (which contains standards for total nutrients). The two soluble compounds currently listed under (17) were previously found in DEQ-7 and, there, linked to the eutrophication narrative standard via footnote 8. These compounds are being superseded by the total nutrients in DEQ-12 Part A. Further, definition (17) added no clear value to the nondegradation rules because, where needed, specific nutrient compounds or forms (e.g., TKN, nitrate as N) are named or referenced. The new definition at (23), "total inorganic phosphorus" is added here because its equivalent form ("phosphorus, inorganic") and associated RRV is being deleted from DEQ-7 as part of the overall movement of eutrophication-oriented nutrient standards to DEQ-12. This compound is only referred to in the nondegradation rules at ARM 17.30715(2)(e) and no concentration limit is associated with it; therefore, only a required reporting value (RRV) is provided. The RRV has been modified (from1 µg/L to 3 µg/L) to reflect routinely-achievable levels and is consistent with RRV derivation methods currently used for compounds in circulars DEQ-7 and DEQ-12. New definitions (24) and (25) correspond to those discussed above for amendments to ARM 17.30.602. In new (28)(a), circular DEQ-12 with a date is provided to assure that readers are using the most current version. In (28)(b), the department circular DEQ-7 definition has been amended for the same reasons described above for ARM 17.30.602.

17.30.715 CRITERIA FOR DETERMINING NONSIGNIFICANT CHANGES IN WATER QUALITY (1) The following criteria will be used to determine whether certain activities or classes of activities will result in nonsignificant changes in existing water quality due to their low potential to affect human health or the environment. These criteria consider the quantity and strength of the pollutant, the length of time the changes will occur, and the character of the pollutant. Except as provided in (2), changes in existing surface or ground water quality resulting from the

activities that meet all the criteria listed below are nonsignificant, and are not required to undergo review under 75-5-303, MCA:

(a) activities that would increase or decrease the mean monthly flow of a surface water by less than 15% or the seven-day 10 year low flow by less than 10%;

(b) discharges containing carcinogenic parameters or parameters with a bioconcentration factor greater than 300 at concentrations less than or equal to the concentrations of those parameters in the receiving water;

(c) discharges containing toxic parameters ~~or nutrients~~, except as specified in (1)(d) and (e), which will not cause changes that equal or exceed the trigger values in department Circular DEQ-7. Whenever the change exceeds the trigger value, the change is not significant if the resulting concentration outside of a mixing zone designated by the department does not exceed 15% of the lowest applicable standard;

(d) and (e) remain the same.

(f) changes in the quality of water for any harmful parameter, including parameters listed in DEQ-12 Part A, for which water quality standards have been adopted other than ~~nitrogen, phosphorous, and~~ carcinogenic, bioconcentrating, or toxic parameters, in either surface or ground water, if the changes outside of a mixing zone designated by the department are less than 10% of the applicable standard and the existing water quality level is less than 40% of the standard;

REASON: The proposed amendments to ARM 17.30.715 will allow the department to calculate nonsignificant changes in water quality for the base numeric nutrient standards in circular DEQ-12 Part A. If adopted by the board, base numeric nutrient standards will preclude the need to use the narrative standards at ARM 17.30.637(1)(e) to interpret eutrophication-based water quality impacts due to nutrients. Base numeric nutrient standards are intended to control eutrophication (see definition of eutrophication in Overview), and at the concentrations found in circular DEQ-12 Part A the department considers base numeric nutrient standards to be harmful parameters. Therefore, DEQ-12 Part A is incorporated into (f), the section of the nondegradation rules addressing nonsignificance specific to harmful parameters. Nitrogen compounds at concentrations that ARE toxic, e.g. nitrate at 10 mg/L, will remain in DEQ-7 (as discussed earlier) and toxics-based nonsignificance criteria applicable to such compounds will continue to be applied to them. The strike-out in (c) corresponds with the retaining of toxic-level nitrogen compounds in DEQ-7, and the move of eutrophication-based nitrogen and phosphorus standards to DEQ-12 Part A.

DEPARTMENT CIRCULAR

DEQ-12, PARTS A and B

Montana Base Numeric Nutrient Standards and Nutrient Standards Variances

GENERAL INTRODUCTION

This circular contains information pertaining to the base numeric nutrients standards (§75-5-103[2], MCA) and their implementation. It is divided into **Parts A** and **B**. **Part A** contains the water quality standards including concentration limits, where they apply, and their period of application. **Part A** is adopted by the Board of Environmental Review under its rulemaking authority in §75-5-301(2), MCA.

Part B contains information about variances from the base numeric nutrient standards. This includes effluent treatment requirements associated with general nutrient standards variances, as well as effluent treatment requirements for individual nutrient standards variances and to whom these apply. **Part B** also contains the Department's definition of the total nitrogen (TN) and total phosphorus (TP) concentrations achievable at the limits of technology. Unlike **Part A**, **Part B** is not adopted by the Board of Environmental Review; **Part B** is adopted by the Department following its formal rule making process, pursuant to §75-5-313, MCA.

The Department has reviewed a considerable amount of scientific literature and has carried out scientific research on its own in order to derive the base numeric nutrient standards (see **References** in **Part A**). Because many of the base numeric nutrient standards are stringent and may be difficult for MPDES permit holders to meet in the short term, Montana's legislature adopted laws (e.g., §75-5-313, MCA) allowing for the achievement of the standards over time via the variance procedures in **Part B**. This approach should allow time for nitrogen and phosphorus removal technologies to improve and become less costly, and to allow time for nonpoint sources of nitrogen and phosphorus pollution to be better addressed.

Circular DEQ-12, PART A

SEPTEMBER 2012 EDITION

1.0 Introduction

Elements comprising Circular DEQ-12, **Part A** are found below. These elements are adopted by the Montana Board of Environmental Review. The nitrogen and phosphorus concentrations provided here have been set at levels that will protect beneficial uses, and prevent exceedences of other surface water quality standards which are commonly linked to nitrogen and phosphorus concentrations (e.g., pH and dissolved oxygen; see Circular DEQ-7 for these standards). The nitrogen and phosphorus concentrations also reflect the intent of the narrative standard at ARM 17.30.637(1)(e), and will preclude the need for case-by-case interpretations of that standard.

1.1 Definitions

1. **Ecoregion** means mapped regions of relative homogeneity in ecological systems, derived from perceived patterns of a combination of causal and integrative factors including land use, land surface form, potential natural vegetation, soils, and geology. See also, endnote 1.

2. **Large river** means a perennial waterbody which has, during summer and fall baseflow (August 1 to October 31 each year), a wadeability index (product of river depth [in feet] and mean velocity [in ft/sec]) of 7.24 ft^2/sec or greater, a depth of 3.15 ft or greater, or a baseflow annual discharge of 1,500 ft^3/sec or greater. See also, endnote 5.

3. **Soluble reactive phosphorus** means dissolved orthophosphate, as P, determined by direct colorimetry from a filtered sample. The pore size of the filter used must be 0.45 µm. The RRV for soluble reactive phosphorus is 3 micrograms per liter.

4. **Total nitrogen** means the sum of all nitrate, nitrite, ammonia, and organic nitrogen, as N, in an unfiltered water sample. Total nitrogen in a sample may also be determined via persulfate digestion, or as the sum of total kjeldahl nitrogen plus nitrate plus nitrite.

5. **Total phosphorus** means the sum of orthophosphates, polyphosphates, and organically bound phosphates, as P, in an unfiltered water sample. Total phosphorus may also be determined directly by persulfate digestion.

6. **Wadeable stream** means a perennial or intermittent stream in which most of the wetted channel is safely wadeable by a person during baseflow conditions.

2.0 Base Numeric Nutrient Standards

Table 12A-1 below shows the base numeric nutrient standards for Montana's wadeable streams and large rivers. Details on how these standards were derived can be found mainly in Addendum 1 of Suplee et al. (2008) and Flynn and Suplee (2011). In **Table 12A-1** nutrient standards for wadeable streams are sub-grouped by ecoregion, either at level III (coarse scale) or level IV (fine scale). Following the ecoregional standards is a list of wadeable streams with reach-specific standards; these waterbodies have characteristics disimilar from those of the ecoregions in which they reside and have therefore been provided reach-specific values. **For wadeable streams, the standards should be applied in this order: reach specific (if applicable) then level IV ecoregion (if applicable) then level III ecoregion. Table 12A-1** also contains a list of large river segments for which base numeric nutrient standards have been developed.

Table 12A-2 contains base numeric nutrient standards for Montana's lakes and reservoirs. The Department has not yet developed regional lake criteria but it is expected that when they are developed they will be sub-grouped by ecoregion. As such, placeholders for future ecoregionally-based criteria are provided in the table. The table also provides for lakes-specific standards. The Department anticipates that reservoir standards will generally be developed case-by-case and, therefore, will be individually listed, as provided for in the table.

Table 12A-1. Base Numeric Nutrient Standards for Wadeable Streams in Different Montana Ecoregions, and Base Numeric Nutrient Standards for Individual Wadeable-stream and Large-river Reaches. Related assessment information is also shown.

		Numeric Nutrient Standard[3]		
Ecoregion[1,2] (level III or IV) and Number, or Individual Reach Description	**Period When Criteria Apply**	**Total Phosphorus (µg/L)**	**Total Nitrogen (µg/L)**	**Related Assessment Information[4]**
ECOREGION (level III or IV):				
Northern Rockies (15)	July 1 to September 30	30	300	125 mg Chl*a* /m^2 and 35 g AFDM/m^2
Canadian Rockies (41)	July 1 to September 30	25	350	125 mg Chl*a* /m^2 and 35 g AFDM/m^2
Idaho Batholith (16)	July 1 to September 30	30	300	125 mg Chl*a* /m^2 and 35 g AFDM/m^2
Middle Rockies (17)	July 1 to September 30	30	300	125 mg Chl*a* /m^2 and 35 g AFDM/m^2
Absaroka-Gallatin Volcanic Mountains (17i)	July 1 to September 30	105	250	125 mg Chl*a* /m^2 and 35 g AFDM/m^2
Northwestern Glaciated Plains (42)	June 16 to September 30	110	1400	
Sweetgrass Upland (42l), Milk River Pothole Upland (42n), Rocky Mountain Front Foothill Potholes (42q), and Foothill Grassland (42r)	July 1 to September 30	80	560	165 mg Chl*a* /m^2 and 70 g AFDM/m^2
Northwestern Great Plains (43) and Wyoming Basin (18)	July 1 to September 30	140	1400	
River Breaks (43c)	NONE RECOMMENDED	NONE RECOMMENDED	NONE RECOMMENDED	
*Non-calcareous Foothill Grassland (43s), Shields-Smith Valleys (43t), Limy Foothill Grassland (43u), Pryor-Bighorn Foothills (43v), and Unglaciated Montana High Plains (43o)**	July 1 to September 30	33	440	125 mg Chl*a* /m^2 and 35 g AFDM/m^2
INDIVIDUAL REACHES (Wadeable Streams):				
Flint Creek, from Georgetown Lake outlet to the ecoregion 17ak boundary (46.4002, -113.3055)	July 1 to September 30	72	500	150 mg Chl*a* /m^2 and 45 g AFDM/m^2
Bozeman Creek, from headwaters to Forest Service Boundary (45.5833, -111.0184)	July 1 to September 30	105	250	125 mg Chl*a* /m^2 and 35 g AFDM/m^2
Bozeman Creek, from Forest Service Boundary (45.5833, -111.0184) to mouth at East Gallatin River	July 1 to September 30	76	270	125 mg Chl*a* /m^2 and 35 g AFDM/m^2
Hyalite Creek, from headwaters to Forest Service Boundary (45.5833,-111.0835)	July 1 to September 30	105	250	125 mg Chl*a* /m^2 and 35 g AFDM/m^2
Hyalalite Creek, from Forest Service Boundary (45.5833,-111.0835) to mouth at East Gallatin River	July 1 to September 30	90	260	125 mg Chl*a* /m^2 and 35 g AFDM/m^2
East Gallatin River between Bozeman Creek and Bridger Creek confluences	July 1 to September 30	50	290	125 mg Chl*a* /m^2 and 35 g AFDM/m^2
East Gallatin River between Bridger Creek and Hyalite Creek confluences	July 1 to September 30	30	300	125 mg Chl*a* /m^2 and 35 g AFDM/m^2
East Gallatin River from Hyalite Creek confluence to the mouth (Gallatin River)	July 1 to September 30	60	290	125 mg Chl*a* /m^2 and 35 g AFDM/m^2
Clark Fork River from below the Warm Springs Creek confluence (46.1881, -112.7680) to the Bitterroot River confluence	July 1 to September 30	20	300	100 mg Chl*a* /m^2 (summer mean); 150 mg Chl*a* /m^2 (summer maximum)
INDIVIDUAL REACHES (Large Rivers[5]):				
Clark Fork River from the Bitterroot River confluence to the Flathead River confluence	July 1 to September 30	24	300	100 mg Chl*a* /m^2 (summer mean); 150 mg Chl*a* /m^2 (summer maximum)
Yellowstone River (Bighorn River confluence to Powder River confluence)	August 1 -October 31	100	750	
Yellowstone River (Powder River confluence to stateline)	August 1 -October 31	150	1150	150 mg Chl*a* /m^2

*For the Unglaciated High Plains ecoregion (43o), criteria only apply to the polygon located just south of Great Falls, MT.

[1] See endnote 1

[2] See endnote 2

[3] See endnote 3

[4] See endnote 4

[5] See endnote 5

Table 12A-2. Base Numeric Nutrient Standards, Other Standards, and Related Assessment Information for Lakes and Reservoirs.

		Numeric Nutrient Standard[6]			
Ecoregion[1] (level III or IV) and Number, or Individual Lake or Reservoir Description	Period of Application	Total P (µg/L)	Total N (µg/L)	Other Standards[7]	Related Assessment Information[4]
LAKES/RESERVOIRS by ecoregion:					
Middle Rockies (17)	Year-round	[]	[]		
Northern Rockies (15)	Year-round	[]	[]		
Canadian Rockies (41)	Year-round	[]	[]		
Idaho Batholith (16)	Year-round	[]	[]		
LAKE SPECIFIC CRITERIA:					
Flathead Lake[8]	Year-round	5.0	95	Secchi depth ≥ 10.4 m during non turbidity-plume conditions. Phytoplankton chlorophyll *a* 1.0 µg/L, expressed as an annual average.	The following parameters expressed as annual averages: soluble reactive phosphorus (SRP), 0.5 µg/L; nitrate + nitrite (NO_{2+3}), 30 µg/L.
RESERVOIR SPECIFIC CRITERIA:					
	Year-round	[]	[]		

[1] See endnote 1

[4] See endnote 4

[6] See endnote 6

[7] See endnote 7

[8] See endnote 8

2.1 Required Reporting Values for Base Numeric Nutrient Standards

Table 12A-3 presents the required reporting values for total phosphorus and total nitrogen, as well as the RRVs for nitrogen fractions that can be used to compute total nitrogen.

Table 12A-3. Required reporting values[a,b] for total nitrogen and phosphorus measurements.

Nutrient		Method of Measurement	Required Reporting Value
Total phosphorus		Persulfate digestion	3 µg/L
Total nitrogen		Persulfate digestion	70 µg/L
Total nitrogen	Sum of:	(a) total kjeldahl nitrogen	150 µg/L
		(b) nitrate + nitrite	See RRVs below
Nitrate- as N			20 µg/L
Nitrite- as N			10 µg/L
Nitrate + Nitrite-as N			20 µg/L

[a] See definition for required reporting values found in footnote 19 of Department Circular DEQ-7.

[b] Concentrations in Table 12A-3 must be achieved unless otherwise specified in a permit, approval, or authorization issued by the Department (DEQ-7; ARM 17.30.702).

2.2 Developing Permit Limits for Base Numeric Nutrient Standards

For total nitrogen and total phosphorus, the critical low-flow for the design of disposal systems shall be based on the seasonal 14Q5 of the receiving water (ARM 17.30.635[4]). When developing permit limits for base numeric nutrient standards, the Department will use an average monthly limit (AML) only, using methods appropriate for criterion continuous concentrations (i.e., chronic concentrations). Permit limits will be established using a value corresponding to the 95th percentile probability distribution of the effluent. The Department shall use methods that are appropriate for criterion continuous concentrations which are found in the document "*Technical Support Document for Water Quality-based Toxics Control*", Document No. EPA/505/2-90-001, United States Environmental Protection Agency, 1991.

3.0 Endnotes

(1) Ecoregions are based on the 2009 version (version 2) of the U.S. Environmental Protection Agency maps. These can be found at: http://www.epa.gov/wed/pages/ecoregions/mt_eco.htm . For Geographic Information System (GIS) use within the Department, the GIS layers may be found at: L:\DEQ\Layers\Ecoregions.lyr

(2) Within and among the geographic regions or watersheds listed, base numeric nutrient standards of the downstream reaches, or other downstream waterbodies, must continue to be maintained.

(3) The 30 day (monthly) average concentration of these parameters may not be exceeded more than once in any five year period, on average.

(4) Related assessment information comprises water quality variables besides total nutrients that are important for assessing eutrophication in waterbodies. In **Table 12A-1**, the values shown refer to bottom-attached (benthic) algae density quantified as chlorophyll *a* (Chl*a*) or ash free dry mass (AFDM) per square meter of stream bottom. The values are the arithmetic mean of ≥10 replicate measures of benthic algae collected in the wadeable zone (water depths ≤ 1m) from a site during a sampling event. A site is a reach of a stream ≥100 m long but <500 m long or, for some larger streams reaches and for large rivers, may be a transect perpendicular to flow. Algae replicates must be collected in the wadeable zone of streams and rivers using a randomized approach or other, unbiased systematic approaches. Chl*a* and AFDM are used to assess the biomass of algae accumulated on the stream bottom; algae is stimulated by excess nitrogen and phosphorus levels and is associated with (for example) impacts to recreational uses and impacts to stream dissolved oxygen levels.

For the Clark Fork River, the maximum summer algae value is the single greatest of any of the monthly mean Chl*a* values at a given site. Therefore, there is only one month each summer representing the maximum. The summer mean is the arithmetic mean of the set of all benthic algae replicates collected at a site during a given summer.

(5) **Table E-1** below shows the beginning and ending locations for large rivers in Montana.

Table E-1. Large river segments within the state of Montana.

River Name	Segment Description
Big Horn River	Yellowtail Dam to mouth
Clark Fork River	Bitterroot River to state-line
Flathead River	Origin to mouth
Kootenai River	Libby Dam to state-line
Madison River	Ennis Lake to mouth
Missouri River	Origin to state-line
South Fork Flathead River	Hungry Horse Dam to mouth
Yellowstone River	State-line to state-line

(6) No lake or reservoir in **Table12A-2** shall have a total nutrient concentration that exceeds the values shown based upon an annual average. The Department will determine on a case-by-case basis whether or not a permitted discharge to a stream or river is likely to be impacting a downstream lake or reservoir. If yes, the permittee would be required to meet its average monthly limit year round.

(7) Parameters listed under this column are standards specific to lakes and reservoirs.

(8) Standards and related assessment information (excluding secchi depth) are to be determined from 0-30 m depth-integrated samples. Samples and secchi depth measurements are to be collected at the Midlake Deep site which is located approximately 1 mile west of Yellow Bay Point in a pelagic area of the lake (approximately at latitude 47.861, longitude -114.067).

4.0 References

The following are citations for key scientific and technical literature used to derive the base numeric nutrient standards. This is not a complete list; rather, it contains the most pertinent citations. Many other articles and reports were reviewed during the development of the standards.

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Circular DEQ-12, PART B

SEPTEMBER 2012 EDITION

1.0 Introduction

Elements comprising Circular DEQ-12, **Part B** are found below. These elements are adopted by the Department following the Department's formal rule making process. Montana state law (§75-5-103 [22], MCA and 75-5-313, MCA) allows for variances from the base numeric nutrient standards (found in **Part A** of this circular) based on a determination that base numeric nutrient standards cannot be achieved because of economic impacts or because of the limits of technology.

1.1 Definitions

1. **Limits of technology** means the best wastewater treatment processes that exist for the removal of nitrogen and phosphorus compounds from wastewater.

2. **Long-term average** means a description of effluent data from a treatment system using standard descriptive statistics and an assumption that the data follow a lognormal distribution. See also, "*Technical Support Document for Water Quality-based Toxics Control*", Document No. EPA/505/2-90-001, United States Environmental Protection Agency, 1991.

2.0 General Nutrient Standards Variances

Because the treatment of wastewater to base numeric nutrient standards in 2011 would have resulted in substantial and widespread economic impacts on a statewide basis (§75-5 -313 [5][a], MCA), a permittee who meets the end-of-pipe treatment requirements provided below in **Table 12B-1** may apply for and may be granted a general nutrient standards variance ("general variance")(§75-5 -313 [5][b], MCA). The department will process the general variance request through the discharge permit, and include information on the period of the variance and the interim requirements. A person may apply for a general variance for either total phosphorus or total nitrogen, or both. The general variance may be established for a period not to exceed 20 years. A compliance schedule to meet the treatment requirements shown in **Table 12B-1** may be granted on a case-by-case basis.

Cases will arise in which a permittee is or will be discharging effluent with N and/or P concentrations lower than (i.e., better than) the minimum requirements of a general variance. And yet, the resulting concentrations outside of the mixing zone still exceed the base numeric nutrient standards. Such discharges are still within the scope of the general variance, because state law indicates that a general variance is allowable if the permittee treats the discharge to, **at a minimum**, the concentrations indicated by §75-5-313(5)(b)(i)and (ii), MCA. Thus, permitted discharges better than those at §75-5-313(5)(b)(i)and (ii), MCA are not precluded from falling under a general variance.

Table 12B-1. General variance end-of-pipe treatment requirements per §MCA 75-5 -313(5)(b), through May 2016.

	Long-term Average	
Discharger Category[1]	**Total P (µg/L)**	**Total N (µg/L)**
≥ 1.0 million gallons per day	1,000	10,000
< 1.0 million gallons per day	2,000	15,000
Lagoons not designed to actively remove nutrients	Maintain current performance	Maintain current performance

[1] See endnote 1

The Department must review the general variance treatment requirements every 3 years to assure that the justification for their adoption remains valid. The purpose of the review is to determine whether there is new information that supports modifying (e.g., revising the interim effluent treatment requirements) or deleting the variance. If a low-cost technological innovation for lowering nitrogen and phosphorus concentrations in effluent were to become widely available in the near future, for example, the Department could (after May 2016) make more stringent the concentrations shown in **Table 12B-1**. If the Department were to adopt general variance treatment requirements more stringent than those provided in **Table 12B-1**, revised effluent limits will be included with the permit during the next permit cycle, unless the demonstration discussed in **Section 2.2** below is made. A compliance schedule may also be granted to provide time to achieve compliance with revised effluent limits.

The Department and the Nutrient Work Group will consider various factors such as the following when determining whether the general variance treatment requirements must be updated in accordance with SB 367, Section 3, Parapgrah 7.. The review will occur triennially and will be carried out at a fairly coarse level (i.e., statewide). :

1. Whether more cost-effective, efficient, and innovative nutrient removal technologies are available.

2. Whether Montana's economic status had changed sufficiently to make nutrient removal more affordable. If new technologies (per 1 above) have not become widely available, the Department will estimate on a statewide basis the cost for facilities within a category (per §75-5-313(5)(b)(i) and (ii), MCA) to move to the next more stringent nutrient treatment level . Nutrient treatment levels are defined in Falk et al. (2011)[1].

3. Whether development of permit limits for base numeric nutrient standards should be revised to reflect N- or P-compound speciation and bioavailability.

[1] See Endnote 2.

Based on the triennial review findings and conclusions, the Department will issue a rulemaking proposal for public comment on the general variances. The proposal will solicit comments from the public on whether the variance should be: (1) re-adopted without changes, (2) re-adopted with changes, or (3) deleted. The results of the review, including variances that were re-adopted without changes, re-adopted with changes, and deleted, and all supporting analyses, will then be submitted to EPA as new or revised water quality standards. EPA will review the information provided and approve or disapprove the variances based on the requirements of the Clean Water Act and EPA's implementing regulations. If the Department does not meet the statutory requirements at SV367, Section 3, Paragraph 7 by implementing the process set out in this paragraph within 24 months after May 31, 2016, the general variance will expire on May 31, 2019.

2.1 Wastewater Facility Optimization Study

Permitees receiving a general variance are required to evaluate current facility operations in order to optimize nutrient reduction with existing infrastructure and shall analyze cost-effective methods of reducing nutrient loading, including but not limited to nutrient trading without substantial investment in new infrastructure (§75-5-313[9][a], MCA). The Department encourages permittees to examine a full array of reasonable options including (but not limited to) reuse, recharge, and land application. The Department may request the results of the optimization/nutrient reduction analysis within two years of granting a general variance to a permittee.

Changes to facility operations resulting from the analysis carried out as above are only intended to be refinements to the wastewater treatment system already in place. Therefore, optimizations:

1. Should only address changes to facility operation and maintenance and should not be structural changes
2. Should not result in rate increases
3. Must include exploration of the feasibility of nutrient trading within the watershed

Who and how the analysis is carried out can be decided by the permittee. The Department encourages the use of a third-party firm with expertise in this subject.

2.2 Option for Remaining at a Previous General Variance Long-term Average

In some cases, a permittee may be able to demonstrate, using water quality modeling or ambient data, that one nutrient is much more strongly limiting. . If such a case can be demonstrated to the satisfaction of the Department, then a permittee can apply for an individual variance which will include discharger specific limits reflecting the highest attainable condition for the receiving water rather than the new

general variance concentration. The permittee will, however, be required to submit the demonstration with the proposed effluent limits to the department for review. In addition, the permittee will be required to provide monitoring water-quality data that can be used to determine if the justifications for less stringent effluent limits continue to hold true. Details on the requirements for making the demonstration and for collecting the monitoring data are provided in the Department guidance document "*Carrying out a Substantial and Widespread Economic Analysis for Individual Nutrient Standards Variances* AND *Guidelines for Determining if a Waste Water Treatment Facility Can Remain at a Previous General Variance Concentration."* Because this status can change, for example due to substantive nonpoint source cleanups upstream of the discharger, status monitoring by the discharger is required.

3.0 Individual Nutrient Standards Variances

Montana law allows for the granting of nutrient standards variances based on the particular economic and financial conditions of a permittee (§75-5-313 [1], MCA). Individual nutrient standards variances ("individual variances") may be granted on a case-by-case basis because the attainment of the base numeric nutrient standards is precluded due to economic impacts, limits of technology, or both. In general, individual variances are intended for permittees who would have financial difficulties meeting even the general variance concentrations, and are seeking individual N and P permit limits tailored to their specific economic situation or meet the requirements of section 2.2.

Unlike the general variances presented in **Section 2.0**, the Department will only grant an individual variance to a permittee after the permittee has made a demonstration to the Department regarding the economic impacts that would be incurred from meeting the standards. The Department, in conjunction with the Nutrient Work Group, has developed as assessment process that must be completed by applicants seeking an individual variance. The assessment process is found in the Department guidance document "*Carrying out a Substantial and Widespread Economic Analysis for Individual Nutrient Standards Variances* AND *Guidelines for Determining if a Waste Water Treatment Facility Can Remain at a Previous General Variance Concentration"*.

A permittee, using the assessment process referred to above, must also demonstrate to the Department that there are no reasonable alternatives (including but not limited to trading, compliance schedules, reuse, recharge, and land application) that would allow compliance with the base numeric nutrient standards. If no reasonable alternatives exist, then an individual variance is justifiable and becomes effective and may be incorporated into a permit following the Department's formal rule making process. Like any variance, such variances must be adopted as revisions to Montana's standards and submitted to EPA for approval. Individual variances the Department may adopt in the future will be documented in **Table 12B-2** below.

Like general variances, the basis and justification for individual variances must be reviewed by the department every three years as part of the water quality standards triennial review. For most individual variances, the basis will be the economic status of the community, i.e., the demonstration of substantial and widespread economic impacts. At the triennial review the Department will consider if

the basic economic status of a community granted an individual variance has changed. The same parameters used to justify the original individual variance will be considered; these are detailed in the guidance document "*Carrying out a Substantial and Widespread Economic Analysis for Individual Nutrient Standards Variances* AND *Guidelines for Determining if a Waste Water Treatment Facility Can Remain at a Previous General Variance Concentration*". If new, low-cost nutrient removal technologies have become widely available, or if the economic status of the community has sharply improved, the basis of the variance may no longer be justified. In such cases the department will discuss with the permittee the options going forward, including but not limited to a permit compliance schedule, trading, reuse, recharge, land application, or a general variance.

Based on the triennial review findings and conclusions, the Department will issue a rulemaking proposal for public comment on the general variances. The proposal will solicit comments from the public on whether each variance should be: (1) re-adopted without changes, (2) re-adopted with changes, or (3) deleted. The results of the review, including variances that were re-adopted without changes, re-adopted with changes, and deleted, and all supporting analyses, will then be submitted to EPA as new or revised water quality standards. EPA will review the information provided and approve or disapprove the variances based on the requirements of the Clean Water Act and EPA's implementing regulations.

Table 12B-2. Table for individual variances that may be adopted.

MPDES Number	Facility Name	Discharge Latitude	Discharge Longitude	Receiving Waterbody	Receiving Waterbody Classification	Long-term Average Total P (µg/L)	Long-term Average Total N (µg/L)	Start Date	Sunset Date (maximum)	Review Schedule (year)	Review Outcome

4.0 Endnotes

(1) Based on facility design flow.

(2) Falk, M.W., J.B. Neethling, and D.J. Reardon, 2011. Striking a Balance between Wastewater Treatment Nutrient Removal and Sustainability. Water Environment Research Foundation, document NUTR1R06n, IWA Publishing, London, UK.